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Inflation:
A Food and Agricultural Perspective

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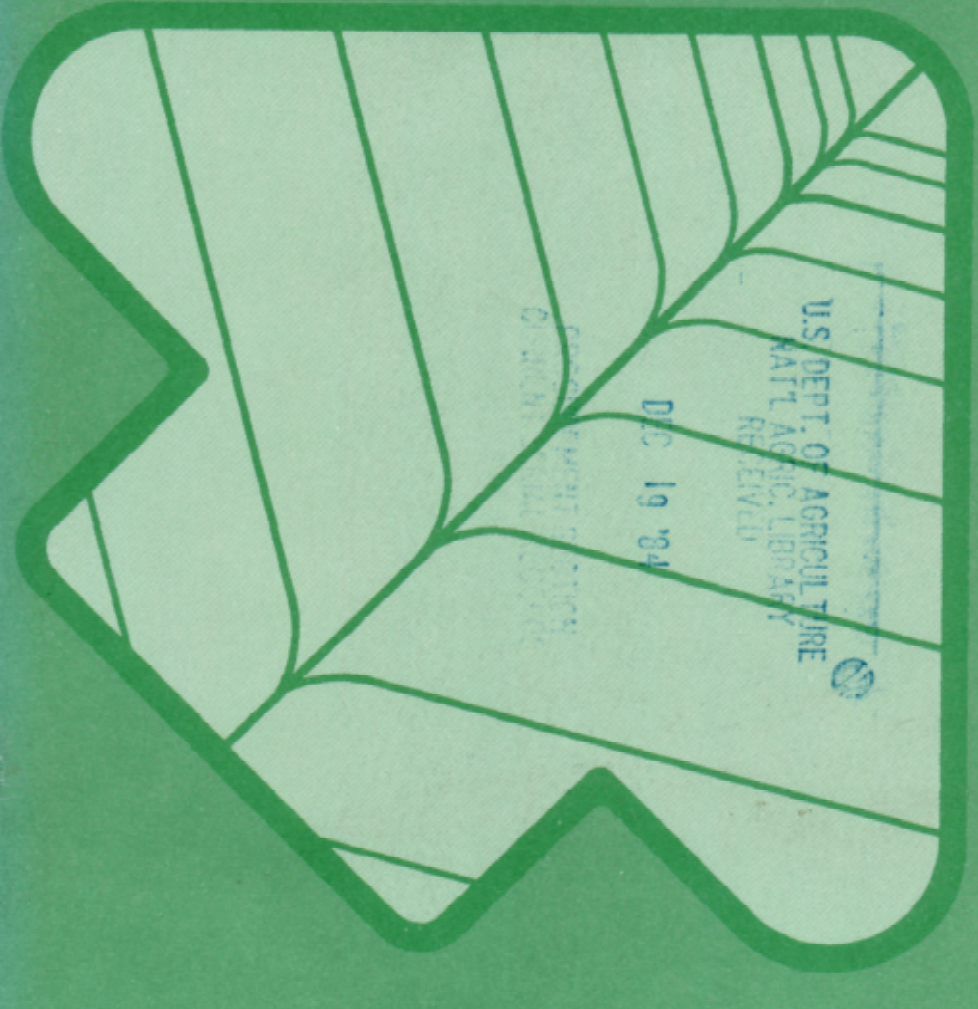

Inflation: A Food and Agricultural Perspective. By Paul T. Prentice and Lyle P. Schertz. National Economics Division, Economics and Statistics Service, U.S. Department of Agriculture. Agricultural Economic Report No. 463.

Abstract

Inflation, a rise in the general price level, affects agriculture in four basic ways. It increases prices of farm products and inputs, encourages farmers to purchase more capital inputs, increases the wealth of those who own the land, and strengthens the relative economic position of high-income people, farm and nonfarm, in buying land. Since the late sixties, changes in prices paid for farm inputs and changes in prices received for farm products have closely corresponded to changes in the general price level. Under inflationary conditions, gains by some often depend on losses by others. This report provides a basis for understanding the causes and effects of inflation as related to agriculture and the conflicting objectives of aiding clientele groups and stopping inflation.

Keywords: Inflation, prices, wealth, food, agriculture

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Summary

Continuous inflation concentrates ownership of resources among the wealthy while producing legislative conflicts in dealing with the problem. As lawmakers consider legislation aimed at inflation in 1981, they must distinguish truth from myth about the causes of inflation, its effects on agriculture, and the impact of programs designed to aid farmers and consumers to cope with it. This report examines these issues.

Inflation has led to increased concentration of land as well as resources among wealthy and high-income groups. But the strengthened ability of such groups to buy land is only one effect of inflation on agriculture. Inflation also has:

— Led to higher prices of both farm inputs and products. But inflation's longrun impact on net farm income is uncertain.

— Stimulated purchases of farm capital inputs, such as larger, more complex machinery, resulting in higher costs of production and pressures for higher commodity price supports. Operators may buy larger equipment and buildings sooner if they expect price increases.

— Increased the wealth of those who own land and other farm assets. Land price changes have kept pace with both inflation and increases in real farm earnings.

Continuous inflation is a relatively recent problem. U.S. history is marked by short periods of inflation followed by long periods of deflation. Inflation has accelerated from an average of slightly less than 2 percent during 1950-64, however, to over 11 percent in 1979 and 13 percent in 1980.

No single factor causes inflation. Among the factors that can contribute are:

— Expansion of demand, including personal consumption, investment, government expenditures, and net foreign trade, when resources for expansion of production are limited. The closer the economy is to full employment of its resources, the faster prices rise. Total government expenditures (Federal, State, and local) as a percentage of GNP have generally risen during recessions and fallen during recoveries, so that excessive government spending as a major cause of inflation is a myth.

— An increased amount of money in the economy or an increase in the number of times money changes hands (velocity). Changes in energy

prices do not lead to continuous inflation unless the money supply is increased. If the money supply were not increased, rises in some prices—in this example, energy—would eventually result in declines in other prices and the general price level would remain unchanged.

— Rising prices pushed up by higher production costs such as energy, labor, and profits instead of by free play of supply and demand. Price increases are not translated into a rise in the general price level, however, unless accompanied by an increased money supply. West Germany, for example, is nearly 100-percent dependent on imported oil, yet its inflation rate is substantially below that of the United States. Thus, higher oil prices as a major cause of inflation is another myth.

Inflation often leads to conflicts. For instance, legislators often try to assist clientele groups in coping with inflation on the one hand and try to stop inflation on the other. The first objective may lead to higher commodity price supports, larger food stamp benefits, and easier credit availability for farmers. In contrast, the second objective may require freezing, decreasing, or even eliminating commodity price supports, food stamp benefits, and special credit programs.

Whether a particular food, agricultural, or rural development program is inflationary or not relates particularly to:

— The effect of the program on supplies of goods and services available on U.S. markets.

— The source of money for the expenditure.

Creating more money to finance such programs is inflationary unless resources are unemployed. This is because the closer the economy is to full employment of its resources, the faster prices rise. A redistribution of incomes among people—such as raising taxes to offset expenditures for farm credit programs or food stamp programs—is not inflationary because the amount of money in the economy has not changed.

Under inflationary conditions, gains by some often depend on losses by others. If one group is protected from inflation, other groups lose—a winners versus losers phenomenon.

Inflation:
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Paul T. Prentice
Lyle P. Schertz
Economists

Introduction

Inflation in the United States accelerated from an average of slightly less than 2 percent during 1950-64 to over 11 percent in 1979. Recent data indicate that except for a cyclical decline, inflation continued to accelerate in 1980. Inflation also affects economic and social activities, including those related to food and agriculture. The spread in the distribution of real income and wealth is made wider. Long-term planning by businesses, consumers, and government agencies is made more difficult, and the social, political, and economic environment less stable.

Legislation which enables certain groups to cope with inflation in the short run may have the net result of fueling a longrun inflationary spiral. Wage increases in response to inflation, for example, cause production costs, and thus prices, to rise. Higher wages are then necessary to catch up to the higher prices, and the wage-price inflationary spiral becomes self-perpetuating. In the agricultural sector, some commodity support and target prices are adjusted to account for changes in cost of production. These adjustments increase the purchasing power of farmers so that input prices are bid up. But then the farm cost of production goes up, giving impetus to a cost-push inflationary spiral.

The difficult choice for policymakers is between helping specific clientele groups cope with inflation on the one hand, and enacting legislation which effectively contributes to a reduction of overall inflation in the general economy on the other. The essential tradeoff is between shortrun goals and longrun solutions.

This paper provides a perspective on inflation for those considering food and agricultural legislation in 1981.

Inflation — What is It?

Inflation, a rise in the general price level, represents a decline in the real purchasing power of money. This definition distinguishes inflation from an increase in the relative price of a particular commodity such as food or oil.

In a market economy, relative prices are constantly shifting as resources adjust to various changes in supply-demand conditions. In periods of stability, some factor and output prices are bid up while others decline, leaving the general price level unchanged. This was the case for the industrial economies for extended periods prior to World War II.

U.S. history has been marked by relatively short periods of inflation followed by longer periods of deflation. In turn, the general price level has varied from one period to another. However, there was no discernible upward trend in prices from 1800 to the middle of this century (fig. 1).

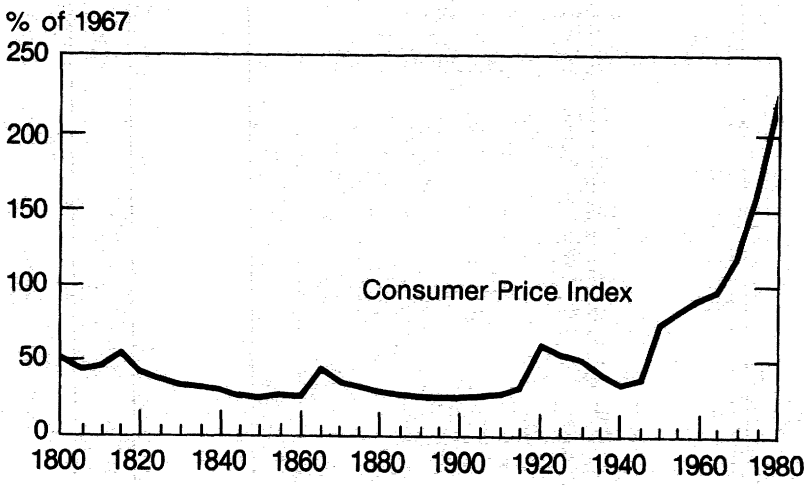
This paper identifies the factors contributing to a continuous rise in the general price level, rather than a one-time increase created by transitory factors.

Rise in the General Price Level

The pattern of stability interspersed with inflation then deflation changed dramatically during the post-World War II period. The general price level rose

Figure 1

Inflation Rises Continuously Since World War II



Source: *(24).*

steadily after the late forties. Increases in relative prices of some products were not fully offset by price decreases for other products, even in the long run.

The removal of price controls following World War II combined with pent-up consumer demand, leading to large increases in the general price level. The Consumer Price Index (CPI), which measures price changes for a fixed market basket of consumer goods, rose 14 percent in 1947 and 8 percent in 1948. The period 1947-48 was clearly inflationary even though it was caused by transitory forces. These forces then subsided and the CPI fell by 1 percent in 1949.

During 1950-64, inflation averaged 1.9 percent per year. Since that time, prices have risen dramatically in four waves. The first peaked in 1966 with a 3.4-percent December-to-December increase in the CPI before it slowed to a rate of 3.0 percent in 1967. The second wave of inflation peaked in 1969 at 6.1 percent. Price controls were then partially responsible for a lower inflation rate—3.4 percent—in both 1971 and 1972. The third onslaught of inflation reflecting the removal of price controls peaked with a 1974 increase of over 12 percent. The rise in the general price level then slowed during and immediately following the 1974-75 recession. The fourth wave of inflation continued in 1980. The increase in the general price level as measured by the CPI was over 13 percent. In the first quarter of 1980, it accelerated to an annual rate of about 17 percent.

The midseventies illustrate the contrast between price changes in recent years and those before 1950. OPEC oil prices increased 340 percent in 1974. This was also a time of sharp increases in the export demand for U.S. farm products. These developments, combined with other factors such as an increase in the money supply, raised the overall CPI 11 percent and the food CPI 14 percent, the highest annual inflation rate since 1948. The United States then experienced the deepest recession since World War II.

But the general price level did not decline even though its rate of increase slowed. Inflation dropped to 5 percent in 1976, almost double the rate of increases during the expansionary phase of most business cycles of the fifties and early sixties. When the economy recovered from the recession, the inflation rate accelerated. Increases in the price of imported oil were outpaced by increases in prices of other products. In fact, the prices of imported oil lagged behind increases of the U.S. general price level by 8 percent during 1974-78. Thus, the increases of relative prices of food and oil in the midseventies have not been offset by declines of other prices either in the short run or long run.

Measures of Inflation

There are two types of measures of changes in the general price level: fixed-weight price indices and variable weight implicit deflators.

The two widely used fixed-weight price indices are the CPI and the producer price index (PPI). The CPI is divided into several major categories such as food, clothing, shelter, and transportation. Each of these categories is further divided into various subcomponents such as grocery store foods, food away from home, and new and used cars. Special indices are created that focus on major parts of consumer costs such as "all items less food" and "all items less energy."

Because the CPI reflects price changes for a fixed market basket of goods, it fails to account for changing consumption patterns, which may change radically during inflationary periods. Thus, the CPI is not an accurate measure of changes in the cost of living. Instead, it answers the question, "If you purchased the same bundle of goods today as in a certain base year, how would the cost today compare with the cost in the base year?" Changes in the CPI often overstate changes in the cost of living. During 1979, the rise in the CPI overstated changes in the cost of living by 20 percent. Net farm income is sometimes deflated by the CPI to obtain "real" net farm income. Given the biases in the CPI, such a procedure overstates the decline in "real" net farm income from its peak in the midseventies.

One further criticism of the CPI is that it includes a large weight on home mortgage interest rates. Since only a small percentage of consumers buy a house in any one time period, the inclusion of mortgage interest rates overstates changes in the cost of living during a period of rising interest rates and understates it during a period of declining interest rates. Anti-inflation policies generally include tighter money and higher interest rates. Thus, the initial effects of anti-inflation policies are to raise the CPI and give rise to a higher rate of measured inflation.

The PPI is a similar fixed-weight price index. It measures price changes for a group of inputs used for production. In addition to the classification across broad categories of inputs, the PPI is broken down into stage-of-processing components. These categories are crude, intermediate, and finished goods. The stage-of-processing approach alleviates the problem of double-counting inherent in the PPI for all commodities, and helps identify where prices are rising in the production process. Wheat, for example, is a crude good. Refined flour is an intermediate good, and wholesale bread is a finished good. The wholesale bread is an input factor contributing to the retail bread CPI. Thus, the PPI is a measure of the cost of nonlabor inputs used in various production, refining, and distributing processes.

As a fixed-weight index, the PPI suffers from some of the same criticisms as the CPI. It does not account for changes in the composition of inputs during inflation, nor for the more efficient use of inputs stemming from productivity increases. The PPI thus tends to overstate changes in the cost of production, and only measures price changes for a fixed basket of inputs. Use of such a price index to determine farmers' parity would understate their economic position because of productivity increases and changing input mix.

In contrast, the variable weight implicit price deflators use weights which reflect current spending patterns. The implicit deflator for the gross national product (GNP) is a broad measure of domestic inflation constructed from price changes for the major components of GNP—consumption, investment, government expenditures, and net exports. The deflators for each of the major components are constructed as a weighted average of prices for various subcomponents, again using variable weights to reflect current spending patterns.

While the actual calculation is somewhat more complicated, the point is that implicit deflators reflect a variable rather than fixed bundle of goods (*28, 29*).[1] Imports are netted out of the GNP equation. The price of imports is subtracted (that is, has a negative weight) in the construction of the implicit deflator for GNP. Thus, the GNP deflator measures the general price level of domestically produced goods and services.

In turn, the different measures of the general price level give different magnitudes of change in the general price level. The relationships of these alternative measurements in the seventies contrast with the relationships in the fifties and the sixties (table 1).

[1]Italicized numbers in parentheses refer to items listed in the References at the end of this report.

Table 1—Average annual change in the inflation indicators

Decade	Implicit GNP deflator	CPI	PPI
		Percent	
Fifties	2.56	2.06	1.86
Sixties	2.54	2.33	1.38
Seventies	6.27	7.11	7.51

The change in the implicit GNP deflator during 6 of the past 7 years was less than changes in either the CPI or the PPI (table 2). The difference was especially great in 1974, when the implicit GNP deflator was 5.6 percent, the CPI was 11 percent, and the PPI was 15.3 percent.

The fixed-weight indices tend to understate the change in the true cost of living during periods of low inflation and stable growth (fifties and early sixties) as consumers "upgrade" their purchases with rising real incomes. They may overstate the true cost of living during periods of high inflation (late sixties and seventies) as consumers "downgrade" their purchases in response to inflation and uncertainty.

"Real" net farm income can vary depending on the choice of price index for deflation. Current dollar net farm income of $31.5 billion in 1979 becomes $13.4 billion in 1967 dollars when deflated by the PPI, $14.5 billion when deflated by the CPI, $15.0 billion when deflated by the GNP implicit deflator, and $15.7 billion when deflated by the implicit deflator for personal consumption expenditures.

Causes of Inflation

Different economists emphasize different causes of a continuous rise in the general price level. The explanations fall into three general categories: demand-pull, cost-push, and monetary.

Demand-Pull Explanations

The demand-pull explanation of inflation focuses on expansion of aggregate demand relative to employment of resources in the economy (*1*, pp. 12 and 323). Substantial inflation does not occur with an expansion of aggregate demand so long as there is slack in resource use. As full capacity is approached, further increases in demand are translated into higher prices in addition to expanded physical output. The closer the economy is to full employment, the faster prices rise.

This explanation calls for a close examination of the components of aggregate demand. These include personal consumption, investment, total government expenditures, and net foreign trade (exports minus imports). The question arises as to which of these components have an inherent tendency to rise by their own inertia, thus creating continuous upward pressure on prices.

Consumption—Personal consumption expenditures are the major component of aggregate demand, accounting for about two-thirds of gross national

Table 2—Year to year changes, 1947-79

Year	GNP	CPI	PPI
		Percent	
1947	13.1	14.2	NA
1948	6.9	7.8	8.0
1949	1.0	1.0	2.9
1950	2.0	1.0	1.8
1951	6.8	7.9	9.5
1952	1.3	2.2	.6
1953	1.5	.8	1.0
1954	1.4	.5	.2
1955	2.2	.4	.2
1956	3.2	1.5	2.8
1957	3.4	3.6	3.6
1958	1.6	2.7	2.3
1959	2.2	.8	.2
1960	1.7	1.6	.8
1961	.9	1.0	.0
1962	1.8	1.1	.3
1963	1.5	1.2	.3
1964	1.6	1.3	.4
1965	2.2	1.7	1.7
1966	3.3	2.9	3.2
1967	2.9	2.9	1.2
1968	4.5	4.2	2.9
1969	5.0	5.4	3.6
1970	5.4	5.9	3.5
1971	5.1	4.3	3.1
1972	4.1	3.3	3.1
1973	5.8	6.2	9.1
1974	5.6	11.0	15.3
1975	9.6	9.1	10.8
1976	5.3	5.8	4.2
1977	5.6	6.5	6.0
1978	7.3	7.7	7.8
1979	8.9	11.3	12.2

NA = Not Available.
Source: (*26*).

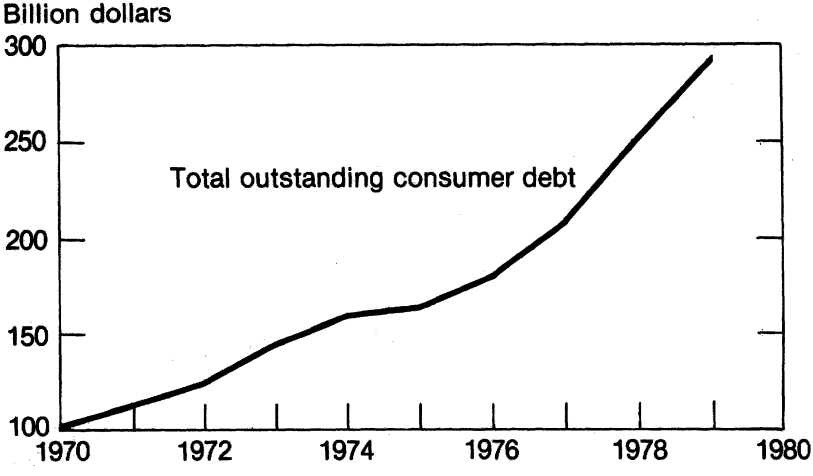
product (GNP). Recent experience indicates that consumers react to inflation with a "buy ahead" psychology. Current inflation creates the expectation of future inflation, causing consumers to deplete savings and take on large debt in order to buy before prices rise further. This expands aggregate demand and creates more inflation, contributing to even greater inflationary expectations.

The spiral of demand-pull inflation tends to perpetuate itself. Whether one takes a macroeconomic view of an aggregate consumption function or a microeconomic view of individual or sectoral demand curves, the consumption component of national income becomes inherently buoyant during inflationary periods. This buoyancy is reflected in the rapid increase in net consumer debt outstanding and the related sharp decline in the personal savings rate during the seventies (figs. 2 and 3).

Investment—Investment plays a unique role in determining aggregate economic activity and inflation. It contributes to current demand for products of the economy. But it also expands production capacity and is often associated with an increase in resource productivity and increased future production. Over time, investment may be deflationary if the stimulus of demand for products at the time of investment is offset by increased future

Figure 2

Consumer Debt Rises in the Seventies



Source: *(26).*

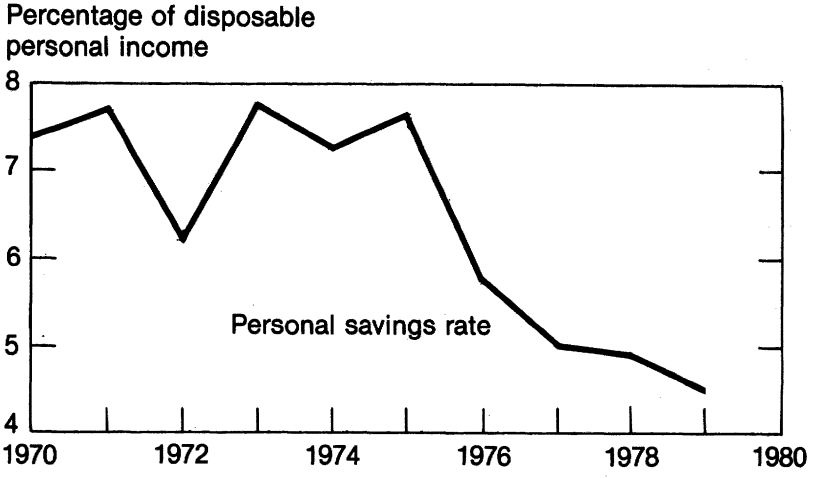
supplies. In contrast, investment may be inflationary if the demand effects outweigh the supply effects.

The demand versus the supply effects of investment has been an important issue related to agriculture as well as industry as a whole. During the seventies, productivity growth in the agricultural sector was consistently higher than the general economy. The issue will likely be of major importance in the eighties. It is important to remember that investments can be deflationary only in the long run if the increased production which flows from them is allowed to modify product prices. Often this is not the case. Therefore, consumers may not benefit from the supply effects of investment. Institutional arrangements and devices to prevent competition from an increased productive capacity can lead to a combination of:

- Higher returns to factors of production, sometimes with associated increases in wealth of asset holders.
- Cutbacks on use of productive capacity; in agriculture, diversion of acreage.
- Promotion of exports to forestall lower product prices.
- Restraints on imports to prevent foreign competition.

Figure 3

Personal Savings Rate Falls in the Seventies



Source: *(25)*.

The debate on investment is also fueled by the slowing of the growth of investment in the United States. For example, U.S. investment expenditures for plant and equipment, adjusted for inflation, rose 73 percent during 1960-69. The increase was only 49 percent during 1970-79 (fig. 4).

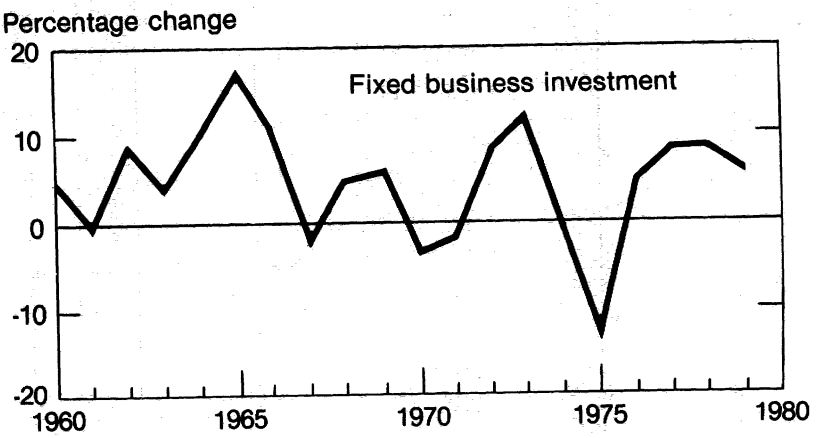
One factor accounting for this slower rate of investment may have been inflation. Many argue that investment funds were increasingly used in speculative activities such as buying and holding precious metals and land instead of expansion and modernization of plant and equipment capacity. This diversion of investment funds can cause a decline in productivity leading to further inflation.

Government—Government expenditures are another controversial component of aggregate demand. Whether financed by taxes or deficit spending, government expenditures increase real output and employment if excess capacity exists, and increase prices at full capacity. The growth in government expenditures adjusted by inflation was 48 percent during 1960-69 and slowed to 10 percent during the seventies. In turn, the government share of GNP was on a downward trend during most of the seventies (fig. 5).

While there are few periods when expenditures actually fall, government spending as a percentage of national income has generally been

Figure 4

Growth Rate of Investment Slows in the Seventies



Source: *(25)*.

countercyclical, tending to rise during recessions (excess capacity) and fall during recoveries (full capacity).

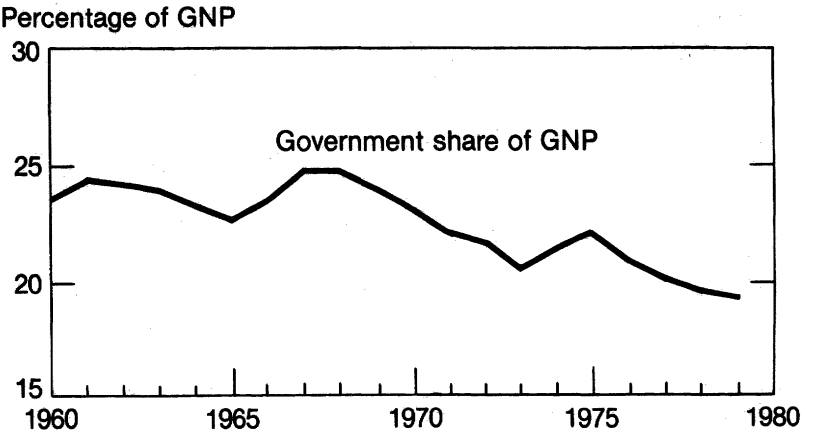
Furthermore, total government deficit, including Federal, State, and local, has declined since the peak of 1975 and the total government budget was in surplus by $13.5 billion in 1979 (fig. 6).

Many tax-transfer and government spending programs are countercyclical and therefore not inflationary over time. However, other programs continue to increase government expenditures even during periods of near full employment and a rising general price level. The clearest examples are programs which are indexed to inflation. As inflation rises, program expenditures rise either because more people are eligible for benefits or the costs per participant are increased. This provides a stimulus to aggregate demand even if the economy is already overheated, creating further inflation.

Furthermore, such programs are usually indexed to the CPI, which tends to overstate increases in the cost of living. During 1979, the CPI overstated the increase in the cost of living by over 20 percent.

Figure 5

Total Government Share of GNP Declines in the Seventies



Source: *(26).*

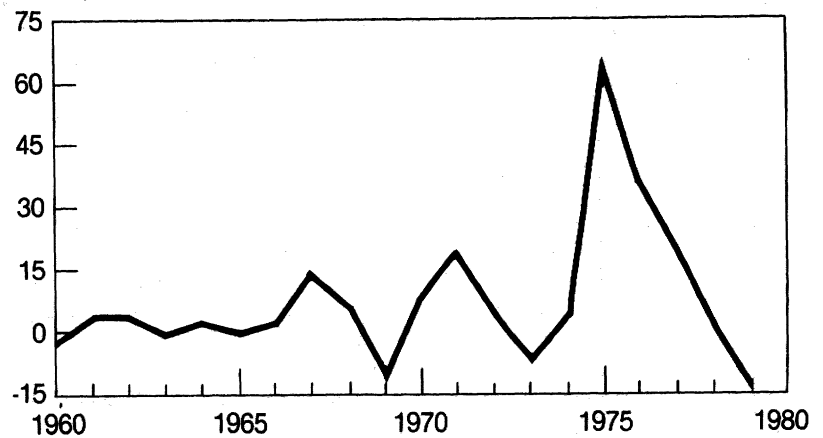
Indexed programs are inherently destabilizing. They provide a continuous stimulus to increases in the general price level during inflationary periods. Thus, while indexing is often designed to protect clientele groups from the effects of inflation, it often contributes to more inflation, thereby strengthening the political pressure for more indexing.

It is important to distinguish between an increase in benefits which are indexed to inflation and an increase in benefits stemming from higher levels of unemployment. Benefits related to unemployment are countercyclical and do not add to inflationary pressures. However, benefits which rise in reponse to inflation may exacerbate inflation when the economy is near full employment.

The food stamp program provides an example of this process. The program transfers income to recipients to enable them to upgrade their diets. Benefits are related to unemployment but are also indexed to the CPI for food. The inflation adjustments prevent real purchasing power of recipients from being eroded by higher food prices. But the higher nominal benefits provide a boost to nominal demand, putting more upward pressure on nominal food prices. An inflationary spiral may result if taxes are not raised to offset the increase in expenditures.

Figure 6

1979 Total Budget $13.5 Billion in Surplus



Source: *(26)*.

Not all legislators may be aware of the monetary implications of deficit financing. Faced with a deficit, the U.S. Treasury has to raise the funds to cover the expenditures. There are two ways, other than taxes, to raise the necessary funds. One is to borrow from the private capital market. If the money supply is held constant, government borrowing acts to crowd out a nearly equivalent amount of private borrowing so that there is little net effect on real aggregate demand (*2*). The combined activities are not inflationary.

To prevent such crowding out in the private market, however, another approach is often followed. The money supply is increased to finance the deficit. This may increase real aggregate demand in the short run but adds to inflationary pressures in the long run (*5*). Policymakers need to be aware of the monetary implications of programs designed to protect clientele groups from inflation. Providing a free lunch to one set of people often leads to a higher priced lunch for others. This analysis applies to all indexed government expenditure programs. Programs must be financed either by tax revenues, government borrowing (which crowds out private capital), or by an inflationary increase in the money supply.

The concept of indexing is often applied to salaries and program benefits paid by the government. However, indexing is also associated with private salaries and wages and government programs as a whole. Budget justifications based on "real expenditures" and adjustment of private wages based on cost of living changes are examples.

Net Exports—The foreign trade sector, exports minus imports, can also affect aggregate demand. Exports contribute to demand. They reduce the supply of goods and services available for domestic purposes, and increase money held by Americans, thus creating inflationary pressures. Imports increase the available supply of goods and services and decrease money held by Americans, creating deflationary pressures. To the extent that foreign trade policies act to stimulate export demand and reduce imports, they are inflationary.

International adjustments in response to changes in exports or imports could mitigate or eventually offset the effects of trade on the general price level. If domestic prices rise as a result of increased exports, the initial effect could be to reduce exports and increase imports, since prices of export products would be higher and prices of imports would be relatively more attractive. Under floating exchange rates and perfect markets, the dollar would be devalued internationally by an amount equivalent to the original inflation, and foreign trade would return to its previous equilibrium.

However, if the devaluation overshoots the domestic inflation, net exports would be overstimulated beyond the previous equilibrium, creating continuous

inflationary pressures. The foreign trade sector is further complicated by flows of international capital since money serves as an asset as well as a medium of exchange (*9*). The experience of the late seventies was one of increasing instability in the foreign exchange markets.

Cost-Push Explanations

Cost-push explanations of inflation are based on the notion that the prices of some factors of production such as labor may be adjusted upward in excess of gains in productivity. If monetary conditions permit, the higher prices prevail without other prices being forced lower, and inflation occurs.

It is useful to examine the record with respect to phenomena often connected with this explanation—energy, labor, and profits.

Energy—Energy is often singled out as a major contributor to inflation during the seventies. The average price of a barrel of crude oil was roughly constant during 1960-69, but rose over 300 percent during 1970-79. The price of a kilowatt of electricity for industrial purposes was also constant during the sixties but nearly doubled during the seventies.

While it is clear that the price of energy inputs increased substantially during 1970-79, it does not follow that this alone caused inflation. Value added by the energy sector accounts for only 4.0 percent of total value added in national production. (Energy inputs account for 3.9 percent of agricultural output and 3.7 percent of food marketing.) Thus, a 100-percent increase in energy prices could cause a 4-percent rise in the general price level.

The logic that energy is not the sole or even the major reason for U.S. inflation is reinforced by the fact that West Germany is almost 100-percent dependent on imported oil, yet its CPI rose only 16 percent during 1975-79, compared with 35 percent for the United States. Furthermore, general U.S. inflation outpaced increases in imported oil prices by 8 percent during 1974-78. Despite the high visibility of energy prices, they likely played a minor role in the inflation of the seventies.

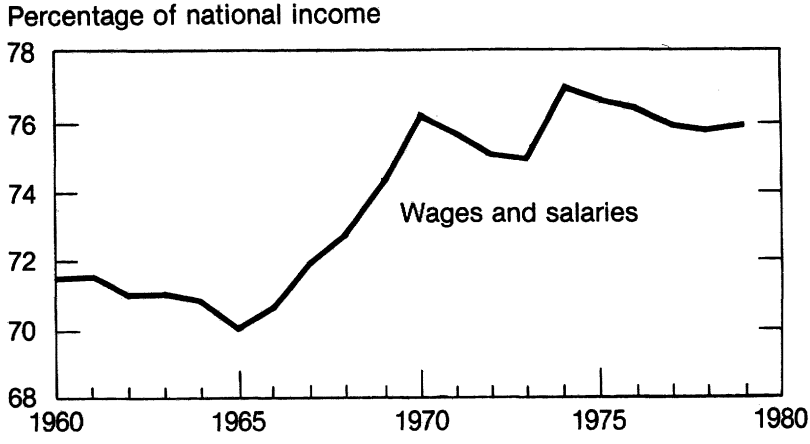
Labor Costs/Productivity—The major cost-push explanation of inflation is the unit labor cost theory (*1*, pp. 324-7). It has gained widespread acceptance among economists, with monetarists being major dissenters. This theory points out that prices are often determined via a cost markup, with unit labor costs accounting for the largest share. For example, the wage and salary share of national income rose from an average of 71.6 percent during the sixties to 76.0 percent during the seventies (fig. 7).

An increase in wages is not, by itself, inflationary. But wage increases in excess of gains in productivity cause unit labor costs, and thus prices, to rise. Administered pricing arrangements facilitate these price increases, and inflation occurs unless tighter monetary conditions bring about lower prices for other products or services. The seventies' relationship between changes in labor costs and changes in productivity of labor differed sharply from that of the sixties. Compensation per worker hour rose 60 percent during the sixties while output per worker hour (or productivity) rose 31 percent. Unit labor costs rose 21 percent and the implicit price deflator rose 22 percent. During the seventies, compensation rose 106 percent but productivity rose just 14 percent. Unit labor costs thus rose 81 percent and the implicit deflator rose 79 percent.

If unit labor costs do in fact determine prices, then the economy has an inherently unstable wage-price spiral through cost-of-living adjustments (COLAs). If an increase in wages is not offset by a rise in productivity, higher prices result. Higher wages are then mandated by COLAs, which lead to higher prices. Wages rose 8.8 percent during 1979, while productivity declined 1.3 percent (figs. 8 and 9).

Figure 7

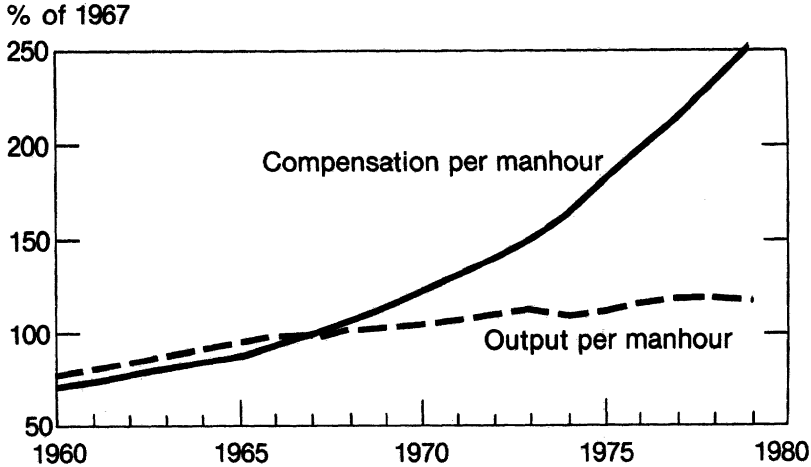
Wage and Salary Share of National Income Rises in the Seventies



Source: *(26).*

Figure 8

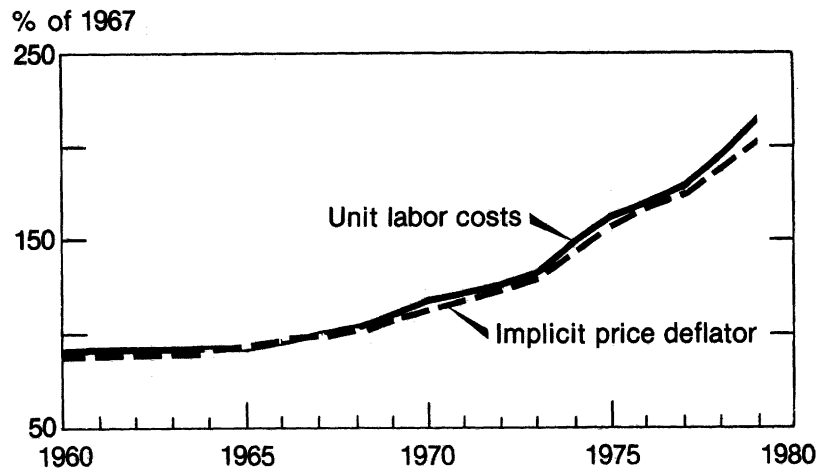
Wages Increase Faster Than Productivity



Source: *(26).*

Figure 9

Unit Labor Costs Push Prices Up



Source: *(26).*

Further pressures are added through the decline in productivity growth associated with inflation, as investment funds are "crowded out" of the capital markets by speculative activity. For the first quarter of 1980, 10 percent of total U.S. business loans went to just one group of speculators in the silver market.

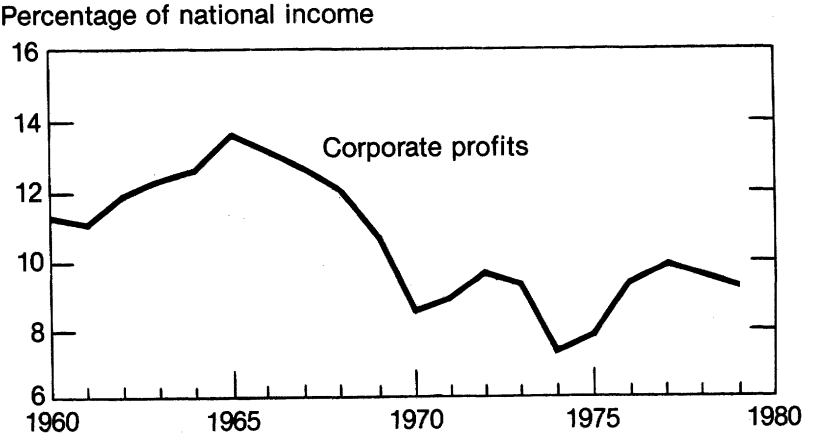
Profits—Oil companies' profits were high during 1979. Their concentration of market power (lack of competition) allowed industry profits to rise substantially. Presumably, a higher degree of competition would reduce oil prices to the level of average costs (including a "normal" return to capital) and reduce excess profits in the industry (*4*, pp. 293–6).

As a counter example, profits rose about 12 percent in the food processing and distributing sector during 1979. These profits induced resources into the sector in the way of thrift food stores and generic products. Partly as a result of the increased competition, retail food prices were remarkably stable during the first half of 1980 and industry profits may decline.

The excess profit theory of inflation does not stand up for the economy as a whole under scrutiny. Corporate profits as a share of national income averaged 12 percent during the sixties but fell to 9 percent during the seventies (fig. 10).

Figure 10

Corporate Profit Share of National Income Declines in the Seventies



Source: *(25)*.

Monetarists argue that cost-push forces can only determine relative prices for individual industries, with the money supply and velocity determining the overall price level (*8*). The policy dilemma is that if money is held constant (and institutional rigidities preclude significant and broad-based price declines), wage increases in excess of gains in productivity would cause widespread unemployment instead of inflation. To avoid unemployment, the money supply is often expanded to accommodate a rise in unit labor costs, causing inflation instead of unemployment.

Monetary Explanations

Monetarists argue that changes in the general price level are determined by changes in the money supply relative to goods available and the rate at which the money is turned over in the economy (velocity). If these forces are constant, then supply-demand shocks cause some relative prices to rise and others to fall, so that the general price level remains unchanged.

The classical monetarist argument is built around an equilibrium condition known as the equation of exchange (*7*). This equation states that the dollar value of transactions in the economy (PxQ) must be equal to the amount of money in circulation (M) times its velocity (V): $MV = PQ$.

A strict monetarist believes that with flexible wages and prices, the economy would naturally tend toward a full employment level of output. With Q fixed and given M and V, the general price level is determined as: $P = MV/Q$.

From an initial equilibrium position, any increase in M or V would raise the general price level, and a decrease in M or V would lower the price level. Since potential output grows with labor force and higher productivity, a certain amount of growth in the money supply can be allowed to accommodate the higher capacity level without raising prices.

If one accepts the monetarist proposition, then V can be derived from historical data as: $V = PQ/M$.

Taking M1 (cash in circulation plus demand deposits at commercial banks) as a measure of M, real GNP as a measure of Q, and the implicit GNP deflator as a measure of P, a measure of velocity is derived (fig. 11).

The continuous upward trend in velocity could be due to technical and institutional changes which cause money to flow more rapidly and allow the banking system to clear balances more rapidly. Faster transportation, greater interlocking of the financial system, computerized check clearing, and

automatic transfer of funds and deposits could all be factors. Another factor may be the use of credit cards, which allows consumers to maintain demand deposits while increasing purchases between paychecks. The late seventies were also characterized by a rapid increase in money substitutes such as certificates of deposit and money market mutual funds.

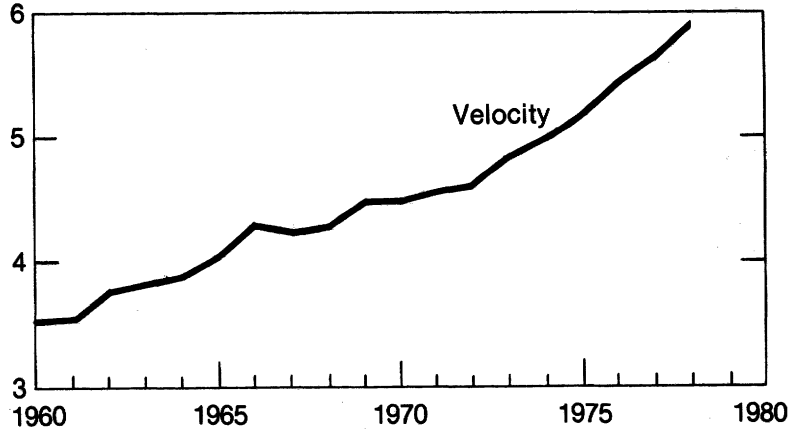
During the fifties and early sixties, both the rate of change in the money supply and in real GNP were growing at about the same rate and inflation was only 1 to 3 percent (fig. 12).

After the midsixties, the money supply grew consistently faster than real GNP, and the inflation rate accelerated sharply. When combined with growth in velocity, these data lend credence to the monetarist belief that inflation is essentially caused by too much money chasing too few goods. Although the classical MV = PQ explanation of the price level has undergone considerable refinement, the core monetarist thesis remains, "Every major inflation has been produced by monetary expansion" (*5*, pp. 1–17).

Figure 11

Velocity of Money Increases

Rate of money turnover



Source: *(26)*.

Those who embrace the demand-pull and cost-push explanation of inflation also argue that increases in the money supply can be inflationary. However, they dismiss the monetarists' determination of the general price level via the equation of exchange. They argue that an increase in the money supply acts to reduce interest rates (*10*, pp. 292–309). This stimulates demand in interest-sensitive sectors such as residential housing and consumer durables. The higher level of aggregate demand then pulls prices up.

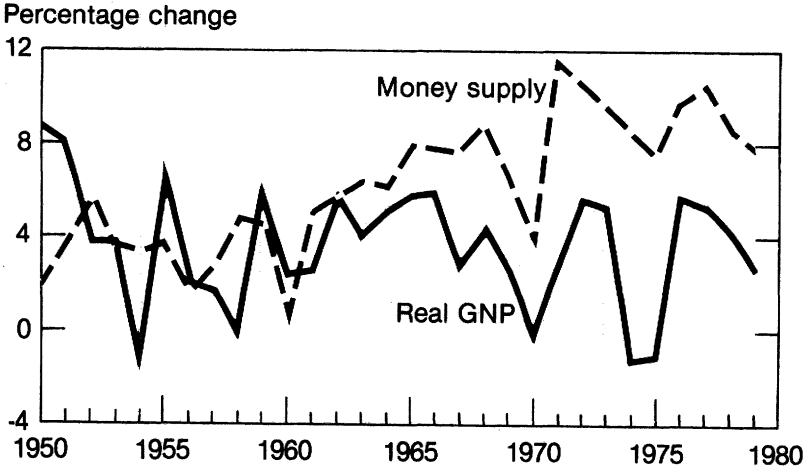
Inflation in the Late Seventies

A wide variety of inflationary forces were at work during the late seventies. Some inherently destabilizing factors caused continuous inflationary pressures. These factors include inflationary expectations in consumer demand, the COLA wage-price spiral, indexing, declining productivity, and persistent monetary expansion.

These destabilizing factors are interrelated by a complex arrangement of political and institutional factors. Cost-push is often accommodated by an increase in the money supply, followed by demand-pull. Wage/ price rigidity

Figure 12

Too Much Money Chases Too Few Goods



Source: *(26)*.

leads to policy accommodations, which lead to further rigidity. In the fall of 1979, for example, auto workers received wage increases exceeding productivity gains by 10 to 12 percent, despite a severe slump in auto sales. Similar wage increases occurred in the markets for agricultural equipment. Because of the steep decline in the economy during the spring of 1980, the Federal Reserve Board increased the growth rate of the money supply. There is also an increasing probability of a tax cut in 1981. The implications are an accelerating inflation rate during the eighties.

The role of policy *vis-a-vis* inflation becomes somewhat clearer. Indexing government programs to protect certain sectors creates continuous inflationary pressures, as do expansive fiscal or monetary policies to accommodate institutional rigidities and supply/demand shocks.

The roles of savings, investment, and productivity will be a major economic issue of the eighties. A mixed policy prescription might include breaking the indexing spiral, adhering to a course of monetary and fiscal restraint, refusing to accommodate wage increases in excess of productivity growth, relaxing protectionist import-export policies, and stimulating the supply rather than the demand side of the economy. The possibilities for supply-side stimuli include a reduction in corporate profit and business income taxes, investment tax credits, wage supplementation, accelerated depreciation allowances, and removal of some regulations which inhibit free competition. To provide funds for investment expansion, policies must also be developed to stimulate savings rather than consumption. These could include tax reductions on interest income and higher interest rates for small savers.

Relationship of Inflation to Farming

Inflation has four primary impacts on U.S. farming:

- It increases nominal prices of farm products as well as the nominal prices of inputs, with uncertain effects on net farm income adjusted for inflation (real net farm income).
- It stimulates farmer purchases of capital inputs with consequent effects on costs of production and pressures for higher commodity price supports.
- It increases the wealth of those who own the land.
- It strengthens the relative economic position of wealthier and higher income people in buying land.

Farm Product and Input Prices

There is little doubt that inflation has a positive effect on nominal prices of both farm products and inputs used in farming. However, the evidence is much less clear as to the effect of inflation on net farm income.

Changes in input prices corresponding to changes in the general price level are consistent with several institutional features of industries which supply inputs to farming. These inputs are produced largely by firms that operate within a system of administered prices—negotiated wages, advertising, restraints of production to levels less than plant capacities to maintain or increase prices, and regulatory setting 1) of prices such as utility prices and 2) in markets with a large number of buyers. Although some farmers are large, most cannot individually influence the price they receive and therefore cannot cost price their products.

Biological processes (such as crop production) restrict the flexibility of producers to adjust production to prevailing prices in the short run. Thus, even if nominal demand schedules respond fully to inflationary forces, it is not clear that the product supply schedules do so, especially in the short run.

On the other hand, institutional arrangements such as price supports and cropland diversion programs influence the supply of farm products. In addition, flexible foreign exchange rates tend to compensate for producers' inability to adjust production in the short run. Increases in the general price level lead to a lower international value of the dollar and therefore lower prices for U.S. farm products in terms of foreign currencies.

The net effect of inflation on the difference between prices paid and prices received—or net farm income—is not clear, however. Tweeten and Griffin argued that farmers are more hurt by inflation than they are helped. Their position was heavily based on the conclusion that "...demand at the farm level is essentially unchanged by national inflation" and that "...each 1 percentage point increase in national inflation directly reduces the ratio of prices received...to prices paid...by approximately 1 percent" (*23*, p. 12).

In a later study based on annual data, Tweeten reconfirmed that "...national inflation strongly influences prices paid by farmers" but also concluded "...that passthrough of national inflation to nominal demand for farm output at the farm level is full and complete in one year." Tweeten also found, however, that "...national inflation moved upward the supply curve through prices paid by farmers proportionately more than it moved upward the demand curve and prices received by farmers..." (*22*, p. 25).

Gardner, examining monthly data, found that it is not clear that product prices "...habitually rise less fast or respond less quickly than input prices under inflation" (*6*). This conclusion is consistent with estimates by the authors based on quarterly data for 1960 through June 1978. The index of prices received by farmers as well as the index of prices paid by farmers were closely correlated with the implicit GNP deflator for this period.

In contrast, the ratio of the index of prices received to the index of prices paid was not significantly correlated with the implicit GNP deflator. Further, the separate correlations between the index of prices received and the index of prices paid were not different enough to be correlated with a change in the terms of trade for farmers (ratio of index of prices received to the index of prices paid) (see appendix).

Shei and Thompson used a different but highly promising approach in measuring the effect of different variables on price changes that occurred in 1973. They found that monetary expansion explained the largest proportion, 48 to 60 percent, of the 1973 changes in four of the price variables studied—livestock prices, industrial prices, service prices, and the general price level. Crop prices were the exception. The Soviet grain purchase explained 57 percent and monetary expansion 34 percent of these price changes (*18*).

In total, institutional arrangements reinforce the escalation of farm input prices in response to inflationary forces. Institutional arrangements for farm product markets are different, however. Both available analysis and examinations of market institutions leave the effect of inflation on product prices uncertain; therefore, the effect on net farm income adjusted for inflation (real net farm income) is uncertain as well.

This conclusion is obviously more ambiguous than implied by a straightforward comparison of changes in prices paid to prices received by farmers. Such a comparison shows that nominal prices paid in 1979 were 2.7 times those paid in the early sixties. Nominal prices received were 2.6 times those in the earlier period, implying a slight effect of inflation on net farm income. But this is not necessarily the case (fig. 13).

Statistical estimates that show high correlations for both prices received and paid to measures of inflation and low correlations for terms of trade do not tell cause and effect.

Relative prices in a market economy change for a variety of reasons. Adjustments in supply and/or demand schedules are involved. Supply and demand schedules, however, are influenced by a mix of factors, some stable,

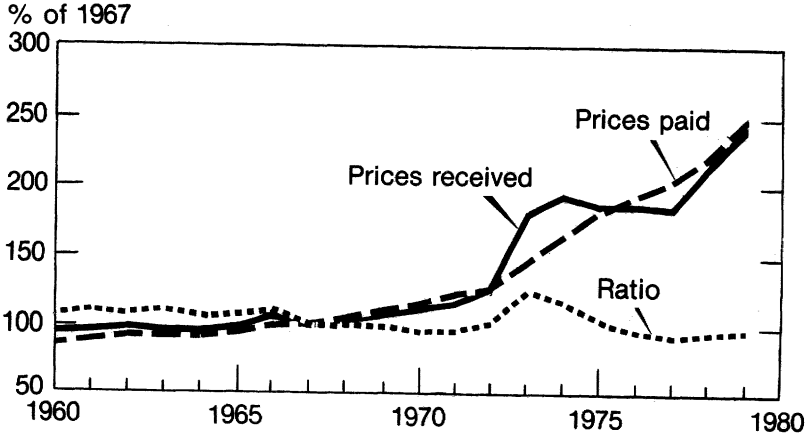
some shifting. Technologies, natural resources, population, and incomes are examples.

Supply and demand schedules for specific products and production inputs are also affected by factors which are major determinants of the general price level. The amount of money is one of these factors. Individuals and managers of institutions such as households, farms, corporations, and pension funds also search for ways to adjust their purchases and/or production during inflationary periods to take advantage of or forestall disadvantages from changes in the general price level. These adjustments are reflected in shifts in supply and demand schedules and in turn contribute to changes in relative prices. Thus, "... inflation can itself cause relative price movements" (*20*, p. 2). In addition, agricultural price support programs are adjusted upwards in response to higher production costs.

Actual changes in prices received and prices paid, then, are due to a number of reasons, of which inflation is only one. Consequently, a word of caution is in order about calculating real prices by adjusting nominal prices using a measure of changes in the general price level. In such calculations, nominal prices are adjusted by a measure of changes in the general price level.

Figure 13

Farm Prices Paid and Received Rise With Inflation in the Long Run



Source: *(26)*.

Suppose that the market price of a product such as wheat was $6 in a recent period, but had been $2.50 in an earlier base period. Suppose also that the general price level had doubled in that time interval. If the wheat price had just kept up with inflation, it would have been $5. Thus, we are prone to say that inflation accounts for $2.50 of the actual $3.50 increase and that the remainder is due to other factors such as increased demand. However, such an assertion assumes that the "index" (used for deflating the nominal prices to obtain real prices) is an accurate measure of changes in the general price level. More importantly, this approach implies that inflation has a one-to-one effect on nominal demand and supply schedules for all items in the economy, and that these effects are in addition to the effects of other variables on these schedules.

These assumptions are wrong, but we do not know to what extent. The important point is that real prices are not necessarily devoid of the effects of inflation, and may therefore be ambiguous in indicating the effects of inflation.

Purchases of Inputs

Inflation encourages farm operators to buy larger equipment and buildings sooner. During inflationary conditions, prices are likely to increase; such increases could mean a speculative gain or at least mitigate potential erosion of the market price of the assets being purchased. This situation encourages lenders to make credit available for equipment even if the capital goods will not be fully utilized immediately.

These conditions could lead to three effects. First, demands and prices of capital goods increase. Second, the investments add to the cost structure of U.S. farming in the short run and are reflected in lower profits of the industry. This effect is translated into pressures for higher price supports and other government actions to increase farm receipts. Third, people anticipate their future equipment requirements and therefore purchase equipment with capacity greater than necessary for land presently under their control. They then seek more land, which contributes to the consolidation of land into larger operating units.

Increases in Wealth

Four points are especially relevant to the relationships between inflation and the wealth of those who own farmland:

- The value of farm assets increased much faster than the rate of inflation during the sixties and seventies.

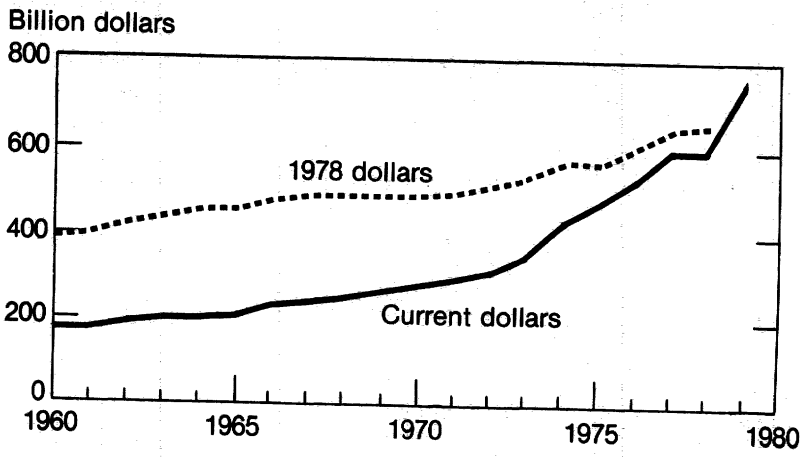
- Farm earnings also increased.
- There is a consistency between 1) the combined effect of inflation and higher farm earnings and 2) changes in the value of assets.
- Returns to farming (earnings and capital gains) have exceeded returns to common stock and thereby encouraged investment in farmland.

Farm people have experienced a dramatic increase in wealth whether measured in current or 1978 dollars (current dollars adjusted for changes in the general price level). In terms of current dollars, farm physical assets (land and buildings, machinery, livestock, and crops stored on and off farms) more than tripled in value during 1960–78 (fig. 14).

Real estate is the largest component of assets (almost 80 percent). It accounted for a slightly larger proportion of the capital gains—84 percent of the change in value of all farm physical assets minus net investment for the 1960–78 period.

Figure 14

Farm Physical Assets Increase Sharply in the Seventies



Source: *(17)*.

The magnitude of increases in farm wealth (capital gains) may be understood better when related to farm earnings over time. In the 7 years during 1972–78, the value of U.S. farm assets more than doubled (table 3). This increase of over $400 billion for these 7 years was nearly three times the total farm earnings in the same period and equivalent to the total of farm income for the whole farm population during 1934–71.

It is useful to conceptualize the capital gains of farm physical assets in two components:

- The inflation offset—an amount of capital gains on assets which would retain the purchasing power of the assets. This would be based on the rate of inflation and the value of the assets at the beginning of each year.[2]
- Other capital gains—the remaining portion of the capital gains on the assets (table 4).

[2]This is not the same as saying that there is a one-to-one relationship of a measure of the general price level and the effect of inflation on asset values.

Table 3—Value of physical farm assets, earnings, and income, selected years

Item	Value
	Billion dollars
Value of physical farm assets:	
January 1, 1960	180
January 1, 1972	315
Increase during:	
1960–71	[1] 140
1972–78	433
Farm earnings:	
1960–71	98
1972–78	157
Farm-related income of farm population:	
1934–59	288
1960–71	141
1972–78	150

[1]Capital gains during 1960–71 were slightly greater than the change in asset values because of the small net disinvestment in farm real estate.

Relationship of Inflation to Farming

Capital gains have failed to equal the rate of inflation in only 2 years (fig. 15). Conversely, the "inflation offset" accounts for slightly over one-half of the capital gains. Thus, the increase in farm-related wealth of farm asset-holders has surpassed the effects of inflation by a wide margin, and their real wealth has increased substantially. Farm wealth as a proportion of total national wealth increased from 7.7 percent in 1970 to 8.7 percent in 1978 (*11*).

Earnings from farming increased significantly in the seventies (*15*). These increased earnings have influenced asset values. Melichar demonstrates that the present value of farm assets is closely related to this growth in earning as well as to the discount rate and the level of current earnings. The higher the growth rate in earnings, the higher the present value of assets. His calculations are in terms of farm asset values and related income flows adjusted for inflation (*13*).[3]

Consequently, if one assumes a one-to-one correspondence between inflation and relative changes in farm earnings and asset values, changes in the real present value of farm assets are accounted for by changes in real farm earnings. Thus, there is an apparent consistency between 1) the combined effect of inflation and higher farm earnings and 2) changes in value of assets.

Two other aspects of Melichar's logic are important to the relationship between inflation and farming. Higher growth of current earnings in the long run result in higher asset values, thus depressing the calculated rate of return to

[3]Similar reasoning suggests that growth in returns associated with forces driving the general price level determine the present value of farm assets. In fact, by deflating asset values as well as income flows, one-to-one relationships to changes in the general price level are implicitly assumed.

Table 4—Capital gains on physical farm assets

Period	Inflation offset	Other capital gains	Total
		Billion dollars	
1960–64	10	26	36
1965–69	36	33	69
1970–74	112	80	192
1975–78	158	128	286
Total	316	267	583

assets and increasing the rates of capital gains. In contrast, low rates of current earnings are often cited to justify steps to increase farm income. The effects of higher growth rates of current earnings on the balance between capital gains and current earnings are overlooked. Equally important are the demonstrated implications of a slowing of the growth rate of current earnings. Such a situation could lead to a depreciation of asset values.

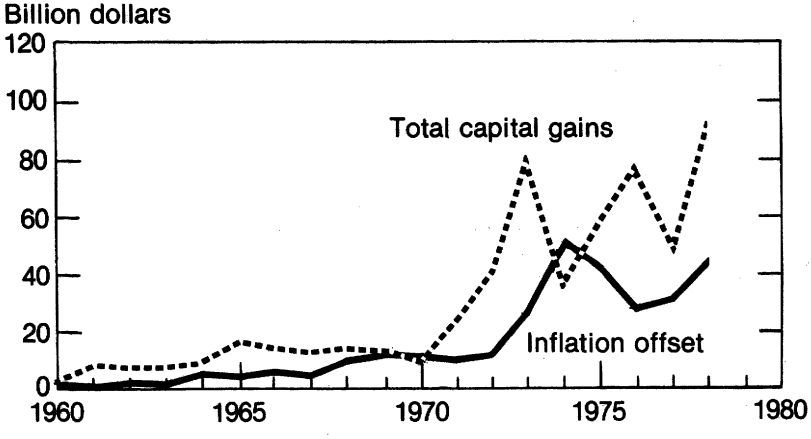
Returns to investments in farming due to changes in real earnings as well as inflation have increased over time relative to returns to investments in common stock of U.S. industry (fig. 16).

These returns have affected future returns to farming and in turn, the demand for farm assets, particularly land. The attractiveness of returns to farm assets over returns on common stock helps explain why some farm people are interested in expanding their holdings of farm real estate. This also is why nonfarm Americans and investors from other countries seriously consider farm opportunities.

A comparison of averages of these returns in the sixties and the seventies illustrates the increased financial attractiveness of farming relative to common

Figure 15

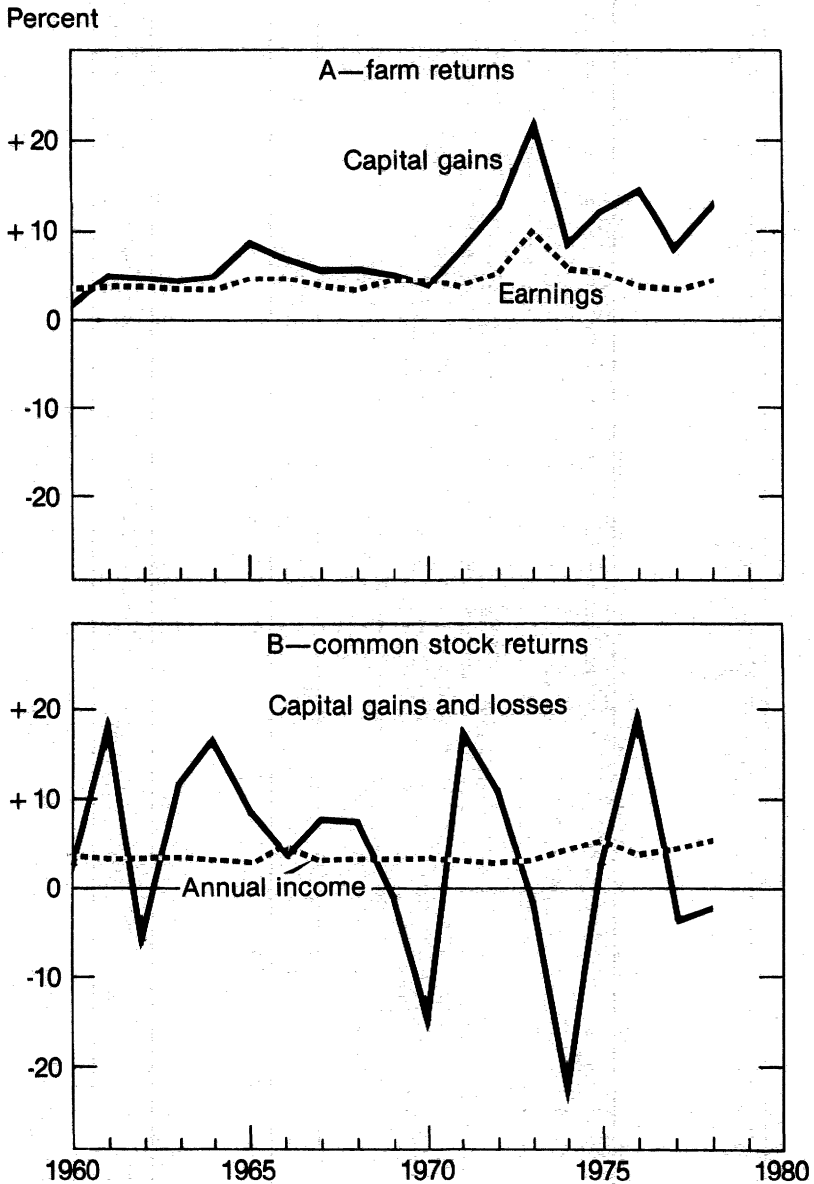
Farm Physical Asset Values Increase Faster than Inflation



Source: *(17).*

Figure 16

Farm Returns Exceed Common Stock Returns



Source: *(17).*

stock. For example, Lins estimates that the 0.27-percent annual earnings spread between farming and common stock in the sixties widened to 0.77 percent in the seventies (table 5). The capital gain return from farming was one-third less than from common stock in the sixties. In the seventies, the capital gain return from farming was over 11 percent per year, while the comparable common stock return was less than 1 percent (*11*).

Income and capital gains differ, but both affect economic welfare. Income is available immediately; capital gains are not unless the assets are transferred. Conversely, capital gains are associated with asset values, and asset values are often the basis for borrowing money. Therefore, capital gains can be monetized even in the short run.

Income is taxable for the year it is received. Capital gains are not taxable until realized and then only 40 percent of the gain is subject to income taxes. Most people prefer to receive a portion of the returns immediately as income or realized capital gains, while delaying the realization of a portion of the capital gains or perhaps income (such as annuities). The balance varies among people and over time. Those without assets have no choice with respect to capital gains.

Strengthening the Position of the Wealthy

In inflationary periods, successful bidding for land is heavily influenced by a combination of the policies of lending institutions and cash flows available to bidders. As Tweeten illustrates, those people with assets and related income who are not dependent on the income generated by the land being purchased can bid more successfully for land than can those without other assets (*21*).

Because increases in land prices have come to be associated with inflation, people seriously consider landownership as a way to accumulate wealth and

Table 5—Returns on farming and common stocks

Period	Farming		Common stocks	
	Annual earnings	Capital gains	Annual earnings	Capital gains
	Percent			
1960–69 avg.	3.46	4.53	3.19	6.99
1970–78 avg.	4.69	11.59	3.92	.72

hedge against inflation. Purchasers of farmland during inflationary periods, however, must have access to monies that are not generated by the land being purchased. While the arithmetic is relatively simple, its effect is very selective in determining who is able to outbid others for the purchase of land.

Interest rates for borrowing money from, say, the Federal Land Banks to purchase farmland are 9 to 10 percent and reflect expected rates of inflation. Estimates indicate that returns to land during the seventies (based on the value of farmland and gross cash rent adjusted for property taxes, management, maintenance, and an allowance for buildings) were about 5 percent (*27*). Historic price changes suggest a long-term price increase in land of an additional 6 to 10 percent per year, yielding a combined eventual return of 11 to 15 percent annually. But the cash flow for such a purchase would be negative if the buyer had to borrow a significant proportion of the purchase price. Only the current returns such as land rentals (5 percent in this example) are available in the short run to pay interest charges and payments on principal associated with the purchase of land (*21*).

Thus, potential purchasers can be divided into two groups — those with and those without income or monies in addition to the income attributable to the land purchased. The first group can outbid the second. In some cases, the first group includes landowners who have income from land that was previously purchased or inherited. In other cases, the first group may have other income or assets that can be sold to generate money to service the debt on the farmland being purchased.

Intrinsic to this grouping of potential land purchasers are the policies of lending institutions. Availability of money to prospective land purchasers influences the willingness of these institutions to extend credit. This is particularly true in inflationary periods when prices of the land and the loan amounts reflect expected inflation of nominal earnings and therefore land prices.

Landownership and farm size patterns are obviously affected by lending policies. But the effect of similar policies in inflationary and stable price situations are markedly different. In inflationary situations people without other sources of money simply do not qualify for loans. In periods of stable prices, those same people may qualify because the interest rate would be commensurate with earnings of investment, and prices of land would not reflect expected increases of earnings associated with inflation.

Commodity programs and tax policies also reinforce the economic strength of those farm and nonfarm individuals who have cash flows other than those

associated with land purchased. Because those programs minimize the risk of commodity prices falling below support levels, potential buyers and credit institutions are willing to extend themselves further. Income tax regulations permit interest payments to be deducted from incomes associated with land purchased as well as other farm and nonfarm earnings, and only 40 percent of any capital gains is taxed. Thus, the trend toward increasing farm size and investments in farms by people who already have wealth and related income is encouraged by inflation and reinforced by agricultural commodity programs and tax policies.

Legislation and Inflation

Inflation and efforts to stop it give rise to conflicts in society. These conflicts are especially relevant to legislation and are intrinsic to the financing of government programs and their effects on supplies in U.S. markets.

Two Themes in Conflict

Inflation often gives rise to conflict. Two major legislative objectives, for example, have opposing implications for legislation related to groups such as food stamp recipients and established farm owner-operators. The two objectives are:

- To enhance the economic position of clientele groups.
- To stop inflation.

The first objective leads to advocacy of higher commodity price supports and food stamp benefits. The second encourages actions which freeze, decrease, or perhaps eliminate commodity price supports and food stamp benefits.

Essentially there is no "free" price increase whether it be in terms of product prices, returns to factors of production, or government benefits. Such increases have to be "paid" for either by increased productivity, by deterioration of a nominal and real fiscal situation, or by deterioration of a real situation by increases in the general price level.

Varied Program Effects

Tradeoffs between assistance to clientele groups and stopping inflation are complex. Whether a particular food, agricultural, or rural development program is inflationary or not relates particularly to:

- The source of money for the expenditure and the implications of the program for the amount of money in the U.S. economy.

- The effect of the program on supplies of goods and services available in U.S. markets.

Effects on the Money Supply

When considering the inflationary effects of any legislation, it is helpful to think first in terms of the legislation's effect on the amount of money in circulation in the United States. This effect may vary from one time to another and is obviously related 1) to the budget situation for the government as a whole and 2) to the priorities for the particular legislation considered.

Different sources and associated implications for the amount of money are:

- Tax revenues which offset the expenditures.[4]

- Borrowing by the U.S. Government of money that would otherwise be in circulation.[5]

- Borrowing by the U.S. Government of money that would otherwise not be in circulation. This could be through the sale of government securities (bills and notes) to people and institutions for money that would not otherwise be in circulation. It might also involve purchase of government securities by the Federal Reserve.[6]

The first source does not increase the money supply. The third does. The second does not increase the money supply initially but the eventual disposition of the debt (by the first or third alternatives) determines its eventual effect on the amount of money in circulation.

The effects of USDA programs on supplies available in U.S. markets differ. Some have no effect, some decrease supplies, and others increase supplies — sometimes with higher costs of production. The combination of changes in the amount of money and the impact of programs on food supplies are important in considering the effect of programs on inflation.

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[4]It is assumed that consumption and investment patterns of society are not changed as a result of the expenditures offsetting taxes.

[5]People and institutions of other countries, as well as Americans and American institutions, buy U.S. Government securities. But Americans also place their money in foreign financial settings. Therefore, it is important to identify money held by Americans and foreigners that 1) would and 2) would not otherwise be in circulation in the United States.

[6]The Treasury may borrow up to $5 billion directly from the Federal Reserve System. The Federal Reserve may also purchase any amount of government securities in the open market (*14*, pp. 270, 271).

In summary, creating more money to finance program expenditures is inflationary unless resources are unemployed and can be employed without increasing per unit costs of production.[7] A redistribution of income, such as tax revenues offsetting expenditures for farm credit or food stamp programs, is not inflationary unless total U.S. production of goods and services is stifled. The mix of products and relative prices may change, however. Programs that limit supplies in U.S. markets—diversion of crop acreage, import restrictions, export promotion—are inflationary even if tax revenues offset the expenditures.

First, consider approaches where financing of the program leaves the amount of money in circulation unchanged. So long as these programs do not stifle production, they would not be inflationary. Such a program could be a food stamp or special estate tax forgiveness program for farmland owners. Such an approach would not involve a change in the total supplies of products and services in the economy. The mix of products would change, however. Government program expenditures or tax forgiveness would increase the disposable incomes of the program participants. In turn, their demands for products would increase.

Taxes would diminish demands. Reduced demands of those people taxed would lead to a decrease in production of products and services. Thus, the way that resources are utilized and the mix of products and services supplied would be changed, but total economic activity would generally remain unchanged, and the price level would reflect this condition.[8] The exception to this general expectation that these programs would not prove inflationary would be if they adversely affected supplies.

Second, consider approaches where the amount of money decreases. The primary example related to food and agriculture issues involves imports, entailing increased supplies in U.S. markets as well as decreases in the amount of money. Thus, they are deflationary.

Third, consider situations in which programs lead to an increase in the amount of money in circulation. One example is a program to provide credit to farmers

[7]The particular effect of any one program on supplies in U.S. markets and on the amount of money in the U.S. economy is a subject for empirical investigation. It is important to recognize that, in some instances, secondary effects in international commodity and monetary markets may mitigate the initial direct effects. Rather than include a large number of qualifications, the authors chose to assert their best judgments to stimulate debate and eventually verify conclusions as to the net effects of the programs on money and supplies in U.S. markets.

[8]The net effect on the general price level would be a function of the price and income elasticities of demand of those taxed as opposed to the comparable elasticities of program participants.

financed through the sale of government securities and equivalent purchases of government securities by the Federal Reserve with related increases in the amount of money in circulation.

Inflation could be associated with this credit program under any of four different conditions:[9]

- Increased production could be accomplished only through production techniques and utilization of resources that led to higher costs of production.
- If increased production were impossible, and the credit program merely resulted in changes in the mix of products and services without an increase in total supplies in U.S. markets.
- Program participants substituted program credit for money that they would have otherwise used for the activity. The displaced money was then used to bid for other products and resources (farm or nonfarm) available in larger amounts at increasing costs or not at all.
- By chance the credit program diminished total supplies of products and services. Such could be the case if the program redistributed resources from one type of production to a less efficient one.

In a manner consistent with the credit program example, a food stamp program involving increased money in circulation would be inflationary if production of products and services demanded by the recipients could be increased only at higher costs or not at all.

Programs that involve a combination of 1) increased money in the economy and 2) larger supplies but at higher costs of production are inflationary. If the larger production were forthcoming without higher costs, however, the general price level would not be affected. This could be the case if there were substantial unemployment of resources and if production could be increased without higher unit costs. The increased demands of recipients would be supplied by the larger production. Total production of goods and services

[9]Theoretically, it is possible to have a situation where production could be increased without increases in cost of production. In such circumstances, the increased amount of money would be offset by increased supplies in markets. Prices would not change and the general price level would of course be unchanged.

would increase, but prices would not; therefore, the general price level would not be affected.[10]

Programs financed in ways which increase the amount of money but leave the amount of supplies unchanged would also be inflationary.

"Payment" denotes the expenditure of government funds for a product or service. A payment to a farm producer to undertake a production practice that leads to greater production of hogs is an example. "Transfer" denotes the expenditure of government funds to individuals or institutions such as corporations as a means of redistributing income without affecting supplies in U.S. markets. Expenditures in amounts greater than necessary to stimulate the production-increasing practice would be an example of a transfer. Thus, expenditures for any one program could include both "payment" and "transfer" components.[11]

Effects on Goods and Services

Programs which stifle production and limit supplies in U.S. markets are inflationary, regardless if the program expenditures are financed by creating money or using tax revenues. Examples include diversion of acreage to discourage production and institutional arrangements such as marketing orders to discourage availabilities of products in U.S. markets. Market order programs, for example, which lower production and supplies in U.S. markets lead to higher prices. In some cases, the restriction on production is achieved by monopolistic activities of producers without government incentives. In other cases, government expenditures are involved, which may add inflationary impetus in addition to the production restraint. This would occur, for example, if expenditures are financed by purchase of government securities by the Federal Reserve or by sale to people who would not otherwise place their money in circulation in the United States.

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[10]Keynes suggests five reasons why prices rise gradually with increases in full employment as contrasted to conditions where the supply of goods is perfectly elastic up to the point of full employment and perfectly inelastic at full and greater employment (*10*, p. 296). Edwards relates these conditions to an explanation of ". . . the 11 years of simultaneous inflation and unemployment we have experienced since World War II" (*3*, pp. 35-37).

[11]Theory indicates that the effect of these two types of expenditures on economic activity is different. The marginal propensity to consume is less than one. Therefore, increases of government payments will expand economic activity somewhat even if they are matched with increased taxes (*12*, p. 53). This could be inflationary if increases in production are possible only at higher costs. In contrast, transfers financed with taxes are not inflationary. The economic activity stimulated by the transfers are offset by the effects of taxes.

Supplies available for consumption are also affected by international trade in agricultural products as well as other products in our economy. Exports decrease supplies available for domestic consumption and increase the amount of money available to Americans to bid for remaining products and services.

Imports, on the other hand, are deflationary. Imports increase supplies in U.S. markets. In addition, the related financial transactions decrease the money available in the United States for purchase of domestic products and services. The opposite is also true; restrictions on imports are inflationary.

New techniques have the potential of increasing production with lower costs. Thus, research expenditures giving rise to discoveries such as more economical ways to organize production or higher yielding crop varieties (depending on other policies) have important effects on product supplies and prices and thereby mitigate inflation over time.[12]

Still another example is food stamp expenditures. The higher real family incomes associated with food stamp programs may have important effects on future productivity of recipients, thereby tempering inflation in the long run.

Thus, effects of government policies and programs on productivity and production are of crucial significance (*16*). The magnitude of the relationships, as well as the timing of expenditures and the associated realization of production changes, is important.

Winners and Losers

People try to gain protection from adverse effects of inflation while realizing its benefits. These efforts to gain protection are often directed toward legislative proposals. The ideal for any group is:

- To arrange protection from increases in the general price level and the specific price increases associated with it.
- To be in a position to take advantage of such increases if they should occur.
- To avoid any burdens associated with steps to arrest inflation.

If major groups are able to protect their positions and avoid adjustment burdens, the forces of inflation are not likely arrested, and inflation continues.

[12]Such programs are deflationary if the changes in total social costs (research expenditures as well as other costs) are less than the value of the products and services produced as a result of the availability of the technology.

The challenge becomes even more complex. Legislation and/or institutional arrangements that protect these groups expose other groups to both the adverse effects of inflation as well as efforts designed to stop inflation. Terms of trade, prices, and employment adjust to favor the protected groups.

These competitive relationships are illustrated 1) by programs financed with tax revenues and 2) by programs financed through the creation of more money.

Tax Revenue Financing

Suppose government expenditures for grain storage or food stamps are financed with tax receipts or borrowings which remove an equal amount of money from circulation. Program recipients have more money as a consequence, but nonrecipients have less. The general price level is not affected. However, the additional money held by recipients buoys their demand for factors of production and consumer goods. Prices increase for the products and factors they demand. But prices of other products and factors of production decrease because those who pay the taxes have less money. Economic conditions improve for program recipients but decline for others through lower absolute and relative incomes and changes in product and factor prices.

More Money Financing

Alternatively, suppose that the financing of government expenditures leads to increases in the amount of money in circulation under full employment conditions. Again, the program recipients have more money, but in this case others do not have less. The general price level, however, is affected. The greater demands of recipients increase related service and product prices. Nominal demands of others and their nominal situations are unchanged. But when inflation is taken into account, they lose relative to program recipients. Their real product prices and real incomes drop. Again, gains by some depend on losses by others in society. The indirect manner in which losers lose with this alternative approach affects its acceptance by the public.

Similar comparisons involving private enterprise—labor management contracts escalating wages under two different monetary conditions—point up similar direct and indirect ways in which losers lose and the crucial role of money.

Tight Money Supply

Suppose that wages for a significant number of workers are escalated and that production has not increased. If the amount of money in the economy is

unchanged, the direct effects of the wage escalations in one sector would be lower product prices and wages in another for those not protected by contracts and similar protective devices. The general price level would not change since the escalated wages and related product price increases would be offset by lower prices for other products and services.

Accommodating Increases of Money

Alternatively, consider a situation where the amount of money is increased to accommodate the escalated wage rates without depressing other product prices and associated wages. Others still lose, but the effects are indirect. Nominal product prices and wages of the losers are unchanged, but the general price level increases as it reflects the escalated wage rates. Thus, real wages and product prices decline. Changes in relative economic position evolve through adjustments that avoid decreases in any product or factor price, but this leads to inflation.

Restraining the amount of money so that some prices decline in order to accommodate inevitable increases in other prices is disliked. Nonetheless, such an approach could curb inflation. It would also likely affect some of the negotiated price increases since the economic harm they do to others would be more obvious to all.

The contrast in attitudes toward direct and indirect ways to relate to price increases is evident in the U.S. approach to increases in energy prices. Energy price increases by themselves do not cause inflation. For example, the demand for petroleum is inelastic. Imposed price increases result in increased amounts of money flowing out of the United States. Without adjustments, the amount of money in circulation in the United States would decline, and less money would be available for other goods and services. The resulting price declines would be such that the general domestic price level remains essentially unchanged. However, the usual policy is to increase the money in circulation in a way that the petroleum price increases are accommodated without other prices decreasing.

Similar reasoning can be applied to protective devices incorporated in USDA programs such as price supports tied to cost of production, food stamps tied to cost of food, increases in administered prices according to cost, or special programs to enhance credit availability.

Consequently, legislative approaches, steps taken by people (and private institutions), and associated monetary and fiscal actions greatly affect the ability of groups in our society to attain protection from adverse effects of inflation and realize its benefits. The interrelationships of these considerations

also affect how groups pursue their economic objectives and how losers in fact lose (through declines in their absolute incomes or declines in their real incomes through increases in the general price level) as a result of inflation.

Reinforcement of Conflict

The winner-loser phenomena associated with inflation reinforce the conflict of the two major objectives identified earlier: 1) enhancing the economic position of clientele groups and 2) stopping inflation. There are strong incentives for clientele groups to advocate legislation and conditions which give them protection from inflation. Such legislation may include indexing administered prices and monetary conditions to accommodate such increases indirectly, rather than directly placing the losses on the losers. These efforts confound the steps taken to stop inflation. The worst situation for anyone, of course, is being both unprotected against the adverse effects of inflation, while having to shoulder a disproportionate share of adjustments aimed at arresting inflation as it continues.

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Appendix

Ordinary least squares regressions were performed with quarterly data for 1960 through June 1978 with a constant elasticity specification as follows:

$PP = a(PGNP)^b e^u$,uN(O,I)	Prices paid as a function of the implicit GNP deflator
$PR = a(PGNP)^b e^u$, uN(OMI)	Prices received as a function of the implicit GNP deflator
$PR/PP = a(PGNP)^b e^u$, uN(O,I)	Terms of trade as a function of the implicit GNP deflator

The equations were re-estimated using the technique of Cochrane-Orcutt since ordinary least squares results indicated a high degree of serial correlation of the error terms. The specific estimates were:

Elasticity	With respect to the implicit GNP deflator
Farm prices received	1.179
(t statistic)	(13.313)
Farm prices paid	1.101
(t statistic)	(6.725)
Terms of trade ratio	-0.035
(t statistic)	(0.0305)

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